



# MPLS LDP-IGP Synchronization

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The MPLS LDP-IGP Synchronization feature ensures that the Label Distribution Protocol (LDP) is fully established before the Interior Gateway Protocol (IGP) path is used for switching.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Prerequisites for MPLS LDP-IGP Synchronization

- This feature is supported only on interfaces running Open Shortest Path First (OSPF) or Intermediate System-to-System (IS-IS) processes.
- This feature works when LDP is enabled on interfaces with either the **mpls ip** or **mpls ldp autoconfig** command.



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## Restrictions for MPLS LDP-IGP Synchronization

- This feature is not supported on tunnel interfaces or LC-ATM interfaces.
- This feature is not supported with interface-local label space or downstream-on-demand (DoD) requests.
- This feature does not support targeted LDP sessions. Therefore, Any Transport over MPLS (AToM) sessions are not supported.

## Information About MPLS LDP-IGP Synchronization

- [How MPLS LDP-IGP Synchronization Works, page 2](#)
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## How MPLS LDP-IGP Synchronization Works

Packet loss can occur because the actions of the IGP and LDP are not synchronized. Packet loss can occur in the following situations:

- When an IGP adjacency is established, the router begins forwarding packets using the new adjacency before the LDP label exchange completes between the peers on that link.
- If an LDP session closes, the router continues to forward traffic using the link associated with the LDP peer rather than an alternate pathway with a fully synchronized LDP session.

The MPLS LDP-IGP Synchronization feature does the following:

- Provides a means to synchronize LDP and IGPs to minimize Multiprotocol Label Switching (MPLS) packet loss.
- Enables you to globally enable LDP-IGP synchronization on each interface associated with an IGP OSPF or IS-IS process.
- Provides a means to disable LDP-IGP synchronization on interfaces that you do not want enabled.
- Prevents MPLS packet loss due to synchronization conflicts.
- Works when LDP is enabled on interfaces using either the **mpls ipor mpls ldp autoconfig** command.

To enable LDP-IGP synchronization on each interface that belongs to an OSPF or IS-IS process, enter the **mpls ldp sync** command. If you do not want some of the interfaces to have LDP-IGP synchronization enabled, issue the **no mpls ldp igp sync** command on those interfaces.

If the LDP peer is reachable, the IGP waits indefinitely (by default) for synchronization to be achieved. To limit the length of time the IGP session must wait, enter the **mpls ldp igp sync holddown** command. If the LDP peer is not reachable, the IGP establishes the adjacency to enable the LDP session to be established.

When an IGP adjacency is established on a link but LDP-IGP synchronization is not yet achieved or is lost, the IGP advertises the max-metric on that link.

## MPLS LDP-IGP Synchronization with Peers

When the MPLS LDP-IGP Synchronization feature is enabled on an interface, LDP determines if any peer connected by the interface is reachable by looking up the peer's transport address in the routing table. If a routing entry (including longest match or default routing entry) for the peer exists, LDP assumes that LDP-IGP synchronization is required for the interface and notifies the IGP to wait for LDP convergence.

LDP-IGP synchronization with peers requires that the routing table be accurate for the peer's transport address. If the routing table shows there is a route for the peer's transport address, that route must be able to reach the peer's transport address. However, if the route is a summary route, a default route, or a statically configured route, it may not be the correct route for the peer. You must verify that the route in the routing table can reach the peer's transport address.

When the routing table has an inaccurate route for the peer's transport address, LDP cannot set up a session with the peer, which causes the IGP to wait for LDP convergence unnecessarily for the sync hold-down time.

## MPLS LDP-IGP Synchronization Delay Timer

The MPLS LDP-IGP Synchronization feature provide the option to configure a delay time for MPLS LDP and IGP synchronization on an interface-by-interface basis. If you want to configure a delay time on an interface, use the **mpls ldp igp sync delay *delay-time*** command in interface configuration mode. To remove the delay timer from a specified interface, enter the **no mpls ldp igp sync delay** command. This command sets the delay time to 0 seconds, but leaves MPLS LDP IGP synchronization enabled.

When LDP is fully established and synchronized, LDP checks the delay timer:

- If you configured a delay time, LDP starts the timer. When the timer expires, LDP checks that synchronization is still valid and notifies the OSPF process.
- If you did not configure a delay time, if synchronization is disabled or down, or if an interface was removed from an IGP process, LDP stops the timer and immediately notifies the OSPF process.

If you configure a new delay time while a timer is running, LDP saves the new delay time but does not reconfigure the running timer.

## MPLS LDP-IGP Synchronization Incompatibility with IGP Nonstop Forwarding

The MPLS LDP-IGP Synchronization feature is not supported during the startup period if IGP nonstop forwarding (NSF) is configured. The MPLS LDP-IGP Synchronization feature conflicts with IGP NSF when the IGP is performing NSF during startup. After the NSF startup is complete, the MPLS LDP-IGP Synchronization feature is supported.

## MPLS LDP-IGP Synchronization Compatibility with LDP Graceful Restart

LDP Graceful Restart protects traffic when an LDP session is lost. If an interface that supports a Graceful Restart-enabled LDP session fails, MPLS LDP-IGP synchronization is still achieved on the interface while it is protected by Graceful Restart. MPLS LDP-IGP synchronization is eventually lost under the following circumstances:

- If LDP fails to restart before the LDP Graceful Restart reconnect timer expires.
- If an LDP session restarts through other interfaces, but the LDP session on the protected interface fails to recover when the LDP Graceful Restart recovery timer expires.

## How to Configure MPLS LDP-IGP Synchronization

- [Configuring MPLS LDP Autoconfiguration with OSPF Interfaces, page 4](#)
- [Disabling MPLS LDP-IGP Synchronization from Some OSPF Interfaces, page 6](#)
- [Verifying MPLS LDP-IGP Synchronization with OSPF, page 7](#)
- [Configuring MPLS LDP-IGP Synchronization with IS-IS Interfaces, page 9](#)
- [Disabling MPLS LDP-IGP Synchronization from Some IS-IS Interfaces, page 13](#)

## Configuring MPLS LDP Autoconfiguration with OSPF Interfaces

The following steps explain how to configure LDP for interfaces running OSPF processes.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **mpls ip**
4. **mpls label protocol ldp**
5. **interface** *type number*
6. **ip address** *prefix mask*
7. **exit**
8. **router ospf** *process-id*
9. **network** *ip-address wildcard-mask area area-id*
10. **mpls ldp autoconfig** [*area area-id*]
11. **end**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	<b>mpls ip</b>  <b>Example:</b> Router(config)# mpls ip	Globally enables hop-by-hop forwarding.
Step 4	<b>mpls label protocol ldp</b>  <b>Example:</b> Router(config)# mpls label protocol ldp	Specifies LDP as the default label distribution protocol.
Step 5	<b>interface type number</b>  <b>Example:</b> Router(config)# interface POS 3/0	Specifies the interface to configure and enters interface configuration mode.
Step 6	<b>ip address prefix mask</b>  <b>Example:</b> Router(config-if)# ip address 10.0.0.11 255.255.255.255	Assigns an IP address to the interface.
Step 7	<b>exit</b>  <b>Example:</b> Router(config-if)# exit	Exits interface configuration mode.
Step 8	<b>router ospf process-id</b>  <b>Example:</b> Router(config)# router ospf 1	Enables OSPF routing and enters router configuration mode.
Step 9	<b>network ip-address wildcard-mask area area-id</b>  <b>Example:</b> Router(config-router)# network 10.0.0.0 0.0.255.255 area 3	Specifies the interface on which OSPF runs and defines the area ID for that interface.

Command or Action	Purpose
<b>Step 10</b> <code>mpls ldp autoconfig [area <i>area-id</i>]</code>  <b>Example:</b>  <pre>Router(config-router)# mpls ldp autoconfig area 3</pre>	Enables the MPLS LDP Autoconfiguration feature to enable LDP on interfaces belonging to an OSPF process. <ul style="list-style-type: none"> <li>If no area is specified, the command applies to all interfaces associated with the OSPF process. If an area ID is specified, then only interfaces associated with that OSPF area are enabled with LDP.</li> </ul>
<b>Step 11</b> <code>end</code>  <b>Example:</b>  <pre>Router(config-router)# end</pre>	Exits router configuration mode and returns to privileged EXEC mode.

## Disabling MPLS LDP-IGP Synchronization from Some OSPF Interfaces

When you issue the `mpls ldp sync` command, all of the interfaces that belong to an OSPF process are enabled for LDP-IGP synchronization. To remove LDP-IGP synchronization from some interfaces, use the `no` form of the `mpls ldp igp sync` command on those interfaces.

Perform the following task to disable LDP-IGP synchronization from some OSPF interfaces after they are configured with LDP-IGP synchronization through the `mpls ldp sync` command.

### SUMMARY STEPS

- `enable`
- `configure terminal`
- `interface type slot / subslot / port [, subinterface-number]`
- `no mpls ldp igp sync`
- `exit`
- `exit`

### DETAILED STEPS

Command or Action	Purpose
<b>Step 1</b> <code>enable</code>  <b>Example:</b>  <pre>Router&gt; enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>

Command or Action	Purpose
<b>Step 2</b> <code>configure terminal</code>  <b>Example:</b> <pre>Router# configure terminal</pre>	Enters global configuration mode.
<b>Step 3</b> <code>interface type slot / subslot / port [. subinterface-number]</code>  <b>Example:</b> <pre>Router(config)# interface POS0/3/0</pre>	Specifies the interface to configure and enters interface configuration mode.
<b>Step 4</b> <code>no mpls ldp igp sync</code>  <b>Example:</b> <pre>Router(config-if)# no mpls ldp igp sync</pre>	Disables MPLS LDP-IGP synchronization for that interface.
<b>Step 5</b> <code>exit</code>  <b>Example:</b> <pre>Router(config-if)# exit</pre>	Exits interface configuration mode and returns to global configuration mode.
<b>Step 6</b> <code>exit</code>  <b>Example:</b> <pre>Router(config)# exit</pre>	Exits global configuration mode and returns to privileged EXEC mode.

## Verifying MPLS LDP-IGP Synchronization with OSPF

After you configure the interfaces for LDP, OSPF, and LDP-IGP synchronization, verify that the configuration is working correctly using the `show mpls ldp igp sync` and `show ip ospf mpls ldp interface` commands.

### SUMMARY STEPS

1. `enable`
2. `show mpls ldp igp sync`
3. `show ip ospf mpls ldp interface`
4. `exit`

## DETAILED STEPS

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### Step 1 enable

Use this command to enable privileged EXEC mode. Enter your password if prompted. For example:

#### Example:

```
Router> enable
Router#
```

### Step 2 show mpls ldp igp sync

Use this command to show that MPLS LDP-IGP synchronization is configured correctly, because LDP is configured and the SYNC status shows that synchronization is enabled.

#### Example:

```
Router# show mpls ldp igp sync
FastEthernet0/0/0:
  LDP configured; SYNC enabled.
  SYNC status: sync achieved; peer reachable.
  IGP holddown time: infinite.
  Peer LDP Ident: 10.0.0.1:0
  IGP enabled: OSPF 1
```

If MPLS LDP-IGP synchronization is not enabled on an interface, the output appears as follows:

#### Example:

```
FastEthernet0/3/1:
  LDP configured; LDP-IGP Synchronization not enabled.
```

### Step 3 show ip ospf mpls ldp interface

Use the output of the **show ip ospf mpls ldp interface** command to show that the interfaces are properly configured:

#### Example:

```
Router# show ip ospf mpls ldp interface
FastEthernet0/3/1
  Process ID 1, Area 0
  LDP is configured through LDP autoconfig
  LDP-IGP Synchronization: Yes
  Holddown timer is not configured
  Timer is not running
FastEthernet0/0/2
  Process ID 1, Area 0
  LDP is configured through LDP autoconfig
  LDP-IGP Synchronization: Yes
  Holddown timer is not configured
  Timer is not running
```

### Step 4 exit

Use this command to exit from privileged EXEC mode. For example:



**Example:**

```
Router# exit
Router>
```

## Configuring MPLS LDP-IGP Synchronization with IS-IS Interfaces

The following sections contain the steps and examples for configuring MPLS LDP-IGP synchronization for interfaces running IS-IS processes:

- [Configuring MPLS LDP-IGP Synchronization on All IS-IS Interfaces, page 9](#)
- [Configuring MPLS LDP-IGP Synchronization on an IS-IS Interface, page 11](#)

### Configuring MPLS LDP-IGP Synchronization on All IS-IS Interfaces

Perform the following task to configure the MPLS LDP-IGP Synchronization feature on all interfaces running IS-IS processes.

**SUMMARY STEPS**

1. enable
2. configure terminal
3. mpls ip
4. mpls label protocol ldp
5. router isis *process-name*
6. mpls ldp sync
7. interface *type slot / subslot / port* [*, subinterface-number*]
8. ip address *prefix mask*
9. ip router isis *process-name*
10. exit
11. exit

**DETAILED STEPS**

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.
	<b>Example:</b>	
	Router> enable	<ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>mpls ip</b>  <b>Example:</b> Router(config)# mpls ip	Globally enables hop-by-hop forwarding.
<b>Step 4</b>	<b>mpls label protocol ldp</b>  <b>Example:</b> Router(config)# mpls label protocol ldp	Specifies LDP as the default label distribution protocol.
<b>Step 5</b>	<b>router isis process-name</b>  <b>Example:</b> Router(config)# router isis ISIS	Enables the IS-IS protocol on the router, specifies an IS-IS process, and enters router configuration mode.
<b>Step 6</b>	<b>mpls ldp sync</b>  <b>Example:</b> Router(config-router)# mpls ldp sync	Enables MPLS LDP-IGP synchronization on interfaces belonging to an IS-IS process.
<b>Step 7</b>	<b>interface type slot / subslot / port [. subinterface-number]</b>  <b>Example:</b> Router(config-router)# interface POS0/3/0	Specifies the interface to configure and enters interface configuration mode.
<b>Step 8</b>	<b>ip address prefix mask</b>  <b>Example:</b> Router(config-if)# ip address 10.25.25.11 255.255.255.0	Assigns an IP address to the interface.

	Command or Action	Purpose
<b>Step 9</b>	<b>ip router isis</b> <i>process-name</i>  <b>Example:</b> Router(config-if)# ip router isis ISIS	Enables IS-IS.
<b>Step 10</b>	<b>exit</b>  <b>Example:</b> Router(config-if)# exit	Exits interface configuration mode and returns to global configuration mode.
<b>Step 11</b>	<b>exit</b>  <b>Example:</b> Router(config)# exit	Exits global configuration mode and returns to privileged EXEC mode.

## Configuring MPLS LDP-IGP Synchronization on an IS-IS Interface

This section contains the steps for configuring the MPLS LDP-IGP Synchronization feature on an interface that is running an IS-IS process.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type slot / subslot / port* [*. subinterface-number*]
4. **ip address** *prefix mask*
5. **ip router isis**
6. **Exit**
7. **router isis**
8. **mpls ldp sync**
9. **exit**
10. **exit**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<p><b>enable</b></p> <p><b>Example:</b></p> <pre>Router&gt; enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Router# configure terminal</pre>	<p>Enters global configuration mode.</p>
Step 3	<p><b>interface</b> <i>type slot / subslot / port</i> [<i>. subinterface-number</i>]</p> <p><b>Example:</b></p> <pre>Router(config)# interface POS0/2/0</pre>	<p>Specifies the interface to configure and enters interface configuration mode.</p>
Step 4	<p><b>ip address</b> <i>prefix mask</i></p> <p><b>Example:</b></p> <pre>Router(config-if)# ip address 10.50.72.4 255.0.0.0</pre>	<p>Assigns an IP address to the interface.</p>
Step 5	<p><b>ip router isis</b></p> <p><b>Example:</b></p> <pre>Router(config-if)# ip router isis</pre>	<p>Enables the IS-IS protocol for IP on the interface.</p>
Step 6	<p><b>Exit</b></p> <p><b>Example:</b></p> <pre>Router(config-if)# exit</pre>	<p>Exits to global configuration mode.</p>
Step 7	<p><b>router isis</b></p> <p><b>Example:</b></p> <pre>Router(config)# router isis</pre>	<p>Enters router configuration mode and enables an IS-IS process on the router.</p>

	Command or Action	Purpose
Step 8	<b>mpls ldp sync</b>  <b>Example:</b> Router(config-router)# mpls ldp sync	Enables LDP-IGP synchronization for interfaces belonging to an IS-IS process.
Step 9	<b>exit</b>  <b>Example:</b> Router(config-router)# exit	Exits router configuration mode and returns to global configuration mode.
Step 10	<b>exit</b>  <b>Example:</b> Router(config)# exit	Exits global configuration mode and returns to privileged EXEC mode.

## Disabling MPLS LDP-IGP Synchronization from Some IS-IS Interfaces

When you issue the **mpls ldp sync** command, all of the interfaces that belong to an IS-IS process are enabled for LDP-IGP synchronization. To remove LDP-IGP synchronization from some interfaces, use the **no** form of the **mpls ldp igp sync** command on those interfaces.

Perform the following task to disable LDP-IGP synchronization from some IS-IS interfaces after they are configured with LDP-IGP synchronization through the **mpls ldp sync** command.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type slot / subslot / port* [*, subinterface-number*]
4. **no mpls ldp igp sync**
5. **exit**
6. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

Command or Action	Purpose
<b>Step 2</b> <code>configure terminal</code>  <b>Example:</b> <pre>Router# configure terminal</pre>	Enters global configuration mode.
<b>Step 3</b> <code>interface type slot / subslot / port [. subinterface-number]</code>  <b>Example:</b> <pre>Router(config)# interface POS0/3/0</pre>	Specifies the interface to configure and enters interface configuration mode.
<b>Step 4</b> <code>no mpls ldp igp sync</code>  <b>Example:</b> <pre>Router(config-if)# no mpls ldp igp sync</pre>	Disables MPLS LDP-IGP synchronization for that interface.
<b>Step 5</b> <code>exit</code>  <b>Example:</b> <pre>Router(config-if)# exit</pre>	Exits interface configuration mode and returns to global configuration mode.
<b>Step 6</b> <code>exit</code>  <b>Example:</b> <pre>Router(config)# exit</pre>	Exits global configuration mode and returns to privileged EXEC mode.

- [Troubleshooting Tips, page 14](#)

## Troubleshooting Tips

Use the `debug mpls ldp igp sync` command to display events related to MPLS LDP-IGP synchronization.

## Configuration Examples for MPLS LDP-IGP Synchronization

The following sections show examples for the MPLS LDP-IGP synchronization feature with OSPF and IS-IS processes:

- [MPLS LDP-IGP Synchronization with OSPF Examples, page 15](#)
- [MPLS LDP-IGP Synchronization with IS-IS Examples, page 15](#)

## MPLS LDP-IGP Synchronization with OSPF Examples

The following task shows how to enable LDP for OSPF process 1. The **mpls ldp sync** and the OSPF **network** commands enable LDP on interfaces POS0/0/0, POS0/1/0, and POS1/1/0, respectively. The **no mpls ldp igp sync** command on interface POS1/0/0 prevents LDP from being enabled on interface POS1/0/0, even though OSPF is enabled for that interface.

```
Router# configure terminal
Router(config)# interface POS0/0/0
Router(config-if)# ip address 10.0.0.1
Router(config-if)# mpls ip

!
Router(config)# interface POS0/1/0
Router(config-if)# ip address 10.0.1.1

Router(config-if)# mpls ip

!
Router(config)# interface POS1/1/0

Router(config-if)# ip address 10.1.1.1

Router(config-if)# mpls ip

!
Router(config)# interface POS1/0/0
Router(config-if)# ip address 10.1.0.1

Router(config-if)# mpls ip

!
Router(config)# router ospf 1

Router(config-router)# network 10.0.0.0 0.0.255.255 area 3

Router(config-router)# network 10.1.0.0 0.0.255.255 area 3

Router(config-router)# mpls ldp sync

Router(config-router)# exit

Router(config)# interface POS1/0/0
Router(config-if)# no mpls ldp igp sync
```

## MPLS LDP-IGP Synchronization with IS-IS Examples

The following examples show the configuration commands you can use to configure MPLS LDP-IGP synchronization on interfaces POS0/2/0 and POS0/3/0, which are running IS-IS processes:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface POS0/2/0
Router(config-if)# ip router isis
Router(config-if)# exit
Router(config)# router isis
Router(config-router)# mpls ldp sync
Router(config-router)# exit
.
.
Router(config)# interface POS0/3/0
Router(config-if)# ip router isis
Router(config-if)# exit
Router(config)# router isis
```

```
Router(config-router)# mpls ldp sync
Router(config-router)# exit
Router(config) exit
Router#
```

## Additional References

The following sections provide references related to the MPLS LDP-IGP Synchronization feature.

### Related Documents

Related Topic	Document Title
MPLS LDP	MPLS Label Distribution Protocol
MPLS LDP Autoconfiguration	MPLS LDP Autoconfiguration
MPLS LDP commands	<i>Cisco IOS Multiprotocol Label Switching Command Reference</i>

### Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

### MIBs

MIBs	MIBs Link
MPLS LDP MIB	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### RFCs

RFCs	Title
RFC 3036	<a href="#">LDP Specification</a>
RFC 3037	<a href="#">LDP Applicability</a>



### Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p>	<a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a>
<p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p>	
<p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	

## Feature Information for MPLS LDP-IGP Synchronization

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

**Table 1**      **Feature Information for MPLS LDP-IGP Synchronization**

Feature Name	Releases	Feature Information
MPLS LDP-IGP Synchronization	Cisco IOS XE Release 2.1	<p>The MPLS LDP-IGP Synchronization feature ensures that the Label Distribution Protocol (LDP) is fully established before the Interior Gateway Protocol (IGP) path is used for switching.</p> <p>In Cisco IOS XE Release 2.1, this feature was integrated on the Cisco ASR 1000 Series Aggregation Services Routers.</p> <p>The following commands were modified: <b>debug mpls ldp igp sync</b>, <b>mpls ldp igp sync</b>, <b>mpls ldp igp sync holddown</b>, <b>mpls ldp sync</b>, <b>show ip ospf mpls ldp interface</b>, <b>show isis mpls ldp</b>, and <b>show mpls ldp igp sync</b>.</p>

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